

set-top boxes should be driven by marketplace forces, not government fiat.

1. The Market for Video Customer Equipment Already is Competitive

The NOI implicitly assumes that the market for set-top boxes is in some way "undeveloped."³³ This assumption is directly contrary to the facts. Indeed, it is difficult to imagine a more developed, competitive, and robust market.

GIC competes aggressively for the business of MSOs, telcos, MMDS, DBS, and other MVPDs. For example, Bell Atlantic, NYNEX Corp. and Pacific Telesis have formed a consortium known as "TeleTV" and have issued a Request for Proposal ("RFP") on the 4 million digital set-top boxes the telcos need to build their video networks.³⁴ The RFP, which was sent to approximately 30 set-top manufacturers, contemplates that as many as three or more suppliers could win the contract.³⁵ GIC's competition for this business is provided by well-established firms such as Scientific-Atlanta, Panasonic, Sony, and Zenith, among others. Competition between these firms is based upon price, quality perceptions, production schedules, feature availability, and a host of other criteria. Moreover, there is increasing interest in the customer equipment market among U.S technology leaders such as AT&T Network Systems, Hewlett Packard, and Apple. These

³³ Id. at ¶ 73(d).

³⁴ See Ellis, Leslie, "Three Baby Bells Issue Set-Top RFP," Multichannel News, March 6, 1995, at 1.

³⁵ Id. at 56.

new entrants are well-funded and experienced in signal processing, computing, and/or manufacturing,³⁶ and will therefore ensure an increasing level of competition in the video equipment manufacturing market.

Competition in the set-top manufacturing industry is furthered by GIC's policy of licensing its DigiCipher II/MPEG-II technology (including the compression and security components) to competitors. System licensees, able to design and manufacture interoperable products, include Hewlett Packard, Zenith and Scientific Atlanta, while semiconductor component licensees include Motorola, LSI Logic, C-Cube Microsystems, SGS Thomson, Samsung Electronics, and Broadcom Corporation. Thus, MVPDs not only have access to a wide variety of manufacturers offering a wide array of technologically superior products, they also have multiple sources of supply for the same technology, which allows them to find the best price/feature mix.³⁷

The benefits of this vibrant competition among equipment manufacturers vying for MVPD business (including the cost savings) redound to cable subscribers by virtue of competition among MVPDs. As competing MVPDs continue to gain penetration and deploy subscriber equipment of various types and through various leasing/purchasing arrangements, cable operators and other MVPDs

³⁶ Brown, Roger, "Peeking Inside the Future Digital Set-Top," Communications Engineering and Design, May 1994, at 30.

³⁷ For example, Hewlett Packard will supply 500,000 digital boxes to TCI to run on TCI systems where GIC boxes are also planned to be deployed.

face increasing competitive pressure to ensure that the new equipment offerings are adequately serving their customers' needs and at reasonable rates. One example of this phenomenon is provided by the recent advent of DBS service. Set-top boxes developed for use with DBS systems include a platform for an electronic program guide.³⁸ As a result of positive consumer reaction to this application, GIC already has received numerous requests from cable operators to include similar functionality in future cable set-tops. Thus, competitive pressure from DBS has provided the necessary incentive for cable operators to upgrade their customer equipment to provide services desired by customers. In short, the increasing level of MVPD service competition provides an additional reason why the government should not impose requirements on the downstream customer equipment market.³⁹

2. Retail Sale

a. The Availability of Customer Equipment on a Retail Basis Should Be Left to the Market

Simply stated, the government should not mandate retail sales of customer equipment (typically, set top boxes). If consumers demand retail availability, and such availability may be offered while maintaining adequate system integrity and

³⁸ The program guide itself is provided by the operator or other programmer. The software underlying the program guide is being provided by GIC and third party vendors.

³⁹ Of course, in addition to the pro-consumer effects of MVPD competition, the Commission's cost-based regulation of customer equipment prices will ensure that consumers benefit from the vibrant competition among set-top suppliers.

ensuring the ability of the network to continue its efficient evolution, marketplace forces will provide it. In other words, if consumers display a preference for networks which offer box ownership, operators and manufacturers will assess whether the risks associated with retail sales of customer equipment⁴⁰ are outweighed by the desire to differentiate service and meet a discerned market opportunity. This is not an academic assessment. If an operator chooses not to make its customer equipment technology available for retail sales, it runs the risk that its competitors will make their equipment available and gain market share at the operator's expense.⁴¹

In short, the market will ensure that an appropriate balance between consumers' desire for ownership and operators' need to ensure system integrity and efficient network evolution is achieved. This analysis is borne out in practice. For example,

⁴⁰ These risks are described in detail in section III(B)(2)(b), below. These risks include the increased threat of piracy; greater potential for technology lock-in, thereby precluding pro-consumer network upgrades; early obsolescence of customer-owned equipment; and increased threats to system integrity due, for example, to greater signal leakage in a retail environment.

⁴¹ If all network operators decide that system integrity cannot be reconciled with retail availability -- despite established consumer demand for retail availability -- this should not be viewed as a market failure. This is so because the market for consumer products associated with video networks is a derivative of the market for the services provided by the video distribution network. If the video network operator is unable to adequately protect the integrity of the network, then it will be unable to provide its service. If video network services are not available, then there will be no demand for video network customer equipment. Thus, for example, if the increased network security problem cannot be resolved, forced retail sales will threaten the derived demand for the equipment in the first place.

where consumers have demanded it and network integrity has not been threatened, retail sale of equipment has been robust -- basic converters, universal remotes, A/B switches, and splitters are all examples of this marketplace dynamic at work.⁴²

A further example of the marketplace reconciling demand for ownership and the need for system integrity and efficient network evolution is presented by some of the equipment proposals being made by video dialtone networks. For example, Bell Atlantic's video dialtone networks are being designed to provide for customer ownership of set-top boxes. The network will rely on customer equipment which separates security/network and non-security functions between a "Network Interface Module" (NIM) and a "Digital Entertainment Terminal" (DET), respectively. Customers could own the DET but not necessarily the NIM. The NIM provides network management and security functions and is intended to be packaged in a module format, which can either be included in a DET or connected to it. The DET is a set-top box that provides a user interface and a navigational facility that allows the subscriber to select services.

Yet another example of the use of customer equipment to differentiate competitive services is provided by the DBS market. DirectTV currently requires customer ownership of equipment, while Primestar intends to lease customer equipment. Thus, DirectTV has

⁴² Attached as an Exhibit are excerpts from Radio Shack catalogs from 1989, 1990, 1991, and 1995 and from a Damark catalog from 1994. A brief review of these excerpts provides a glimpse of the development of the market for certain equipment.

determined that the security and other network integrity risks inherent in customer ownership are justified by consumer preferences for ownership. Individual customer decisions will determine which method is preferred. Use of government resources in this regard would be wasteful.

b. Government Mandated Retail Sale of Video Customer Equipment Could Harm the Public Interest

A government mandate for the retail sale of customer equipment could seriously threaten important public interests. These public interest concerns flow from one central concept: in a dynamic marketplace such as that faced by MVPDs, the network operator must have sufficient control over the network to allow timely and effective responses to marketplace pressures. Equipped with adequate network control, network operators can ensure signal security, efficient network evolution, and other important interests. If operators are denied adequate network control through forced regulatory solutions, these important public interest concerns will be at substantial risk. This is so because each MVPD network is unique;⁴³ "one-size-fits-all" regulations simply will not fit "tailor-made" networks. Moreover, the relative importance of each public interest concern will vary from network to network, making a national assessment of these concerns practically impossible. The specific public interest concerns are discussed below.

⁴³ For example, modulation, encryption/decryption, system architecture, and a vast variety of other network parameters differ significantly from system to system.

First, government mandated retail sales could damage a distributor's business by forcing a regulatory solution upon it at a time when technology is unable to ensure adequate security in such an open market. As discussed in section I, supra, without assurances of adequate security, producers are less likely to make intellectual property available for distribution.⁴⁴

GIC's concern for security is not unreasonable. The compromise of a security system is a very real and sizeable business cost. Because networks are unique, individual network operators must be allowed to assess the potential for increased security risks in a retail environment against the possible benefits. Forcing a particular type of solution -- such as Bell Atlantic's NIM/DET architecture or DirectTV's Smart Card -- upon every operator may expose many operators to unacceptable levels of signal piracy. While certain distributors, having decided that the potential for increased subscribership outweighs the increased risk of piracy, have implemented business plans that allow for retail sale of equipment, this is a complex risk/return

⁴⁴ These risks are further compounded when one considers the lack of clarity as to who would bear the cost of security breaches in a retail sale scenario. To the extent it falls upon the operator, the primary market for video distribution networks is threatened. All of which raises an interesting point: who should bear the burden of compensating the network operator in the event of a security breach? Should the retailer be liable in tort? If so, should liability sound in negligence theory or strict liability theory? In addition, who should compensate consumers whose purchased equipment is rendered obsolete by a security breach in a retail setting? Seen in this light, the policy ramifications of mandated retail sales are profound and far-reaching.

business decision that is properly left to the individual distributor.

Second, if network operators lack sufficient network control, the future evolution of the network could be threatened. In essence, if retail sale is mandated, the network could become the victim of "bad lock-in" or "excess inertia."⁴⁵ If a sufficient number of subscribers purchase set-tops for the existing system that are incompatible with subsequently developed technologies, the network operator might be prevented from upgrading its network to the new technology due to subscriber resistance. This harms the public interest because all subscribers are denied access to the new services and efficiencies contemplated by the upgrade. The network operator can choose the proper timing and/or form of retail sale availability that minimizes the "bad lock-in" risk.

The converse of the "bad lock-in" problem is early obsolescence. Early obsolescence occurs when subscribers purchase set-tops and the network operator upgrades the network such that new set-tops are required. The subscribers' investment in the now-obsolete set-tops is stranded. This is an unacceptable result for most consumers, who generally expect

⁴⁵ See Michael L. Katz and Carl Shapiro, "Product Introduction with Network Externalities," The Journal of Industrial Economics, Vol. XL, at 55 (Mar. 1992); Michael L. Katz and Carl Shapiro, "Product Compatibility Choice in a Market with Technological Progress," 38 Oxford Economic Papers 146 (Nov. 1986); Stanley M. Besen and Leland L. Johnson, Compatibility Standards, Competition, and Innovation in the Broadcasting Industry, Rand Study, at 22-23 (Nov. 1986).

their purchased consumer electronics equipment to have a 10-15 year lifespan -- in many families, this is a financial necessity.⁴⁶ Again, allowing the network operator, guided by marketplace forces, to control the timing and form of retail sale will minimize this problem.

Finally, if the Commission mandated retail sale, there is a risk that cable systems would lose end-to-end control of system leakage performance.⁴⁷ An improperly designed set-top box, or one that is damaged or modified, could easily cause interference to aeronautical radio services, or interfere with the proper operation of the MVPD's service to the customer or his/her neighbors. This is because the box could radiate the cable system's broadband signal into the air or transmit uncontrolled upstream signals.⁴⁸

⁴⁶ In this regard, rental of set-top boxes serves important public interest goals. It promotes technological innovation by avoiding "bad lock-in," protects consumers against the risk of early obsolescence, and reduces cost barriers to new subscribers, which is particularly important in a dynamic industry.

⁴⁷ This is more likely in a retail environment because: (1) consumers who own integrated converter/descramble boxes will have a greater incentive to open them up and modify them by replacing chips with "test chips" that defeat scrambling; and (2) where there is widespread retail sale of boxes, there will be widespread sale of pirate boxes, and the pirates have no incentive to comply with applicable FCC Part 15 leakage requirements with which the legal boxes must comply.

⁴⁸ This will become increasingly true as cable networks implement two-way functionality. In such an interactive environment, and given cable's distributed bus architecture, ill-designed, malfunctioning, or tampered-with customer equipment could have severe effects on network integrity that may be felt by many subscribers.

c. The Telco CPE Analogy Is Inapt

Proponents of government-mandated retail sales often point to the CPE market in the telephone industry as an example of the potential benefits of retail CPE availability. However, the analogy to telephone CPE is inapt. Most importantly, a cable set-top device handles network security, system integrity, and network signalling functions and, as such, is more akin to a telephone switch located in a telco's central office than it is to the subscriber's telephone CPE, which is essentially a "dumb" device. In light of this critical functional distinction, careless application of what may have worked for telco CPE to the video context is liable to generate a variety of unintended and unpleasant consequences.

First, and perhaps most important, the protection of intellectual property is not an issue for telephony CPE. Residential telephones do not contain intellectual property protection circuitry, and the signals carried by those phones typically have limited value to others. Therefore, sale of those phones does not enhance the risk of theft of intellectual property.

Second, in the telco arena, signal leakage is not an issue. An unconnected phone line or improperly attached or constructed telephone simply does not pose the same problems, since the signal frequencies used in telephony do not interfere with other services if they leak out of the telephone plant.

Finally, because much of the intelligence of a video network resides in the customer's set-top equipment, government mandated retail sale of this equipment would substantially increase the likelihood of network technology "lock-in" on the one hand, and early obsolescence of customer equipment on the other. By contrast, because the telephone network is designed with the network control, security, and other "intelligent" functions residing in the switch, retail sale of the essentially "dumb" telephone equipment is not problematic from an efficient network evolution perspective.

Based on the foregoing potential public interest harms, it is clear that government mandated retail sale for video customer equipment should be avoided. The marketplace is a far better arbiter of the risks and benefits inherent in a retail sale environment and should be permitted to work in this area as it has -- successfully -- in the past.

C. Equipment Compatibility

1. Incompatibilities Between TVs/VCRs and MVPDs Are the Inadvertent Byproduct of Industries with Different Technology Life Cycles

In ¶ 72 of the NOI, the Commission notes that it is interested in technologies that facilitate consumer access to various distribution media in a compatible manner. As an initial matter, GIC urges the Commission to analyze the equipment compatibility issue in its proper perspective, outside the cloud of invective which has often surrounded it. The most important point is that incompatibilities are not inherently sinister;

rather, they typically result from a variety of factors, all of which serve the public interest in their own right.

For example, equipment incompatibilities often result from the differing product life cycles for the consumer electronics and video distribution industries. The consumer electronics industry evolves slowly, adopting new functionalities and technologies when those technologies and functionalities become proven and stable. This allows higher-cost items, such as television sets, to have extended lifetimes. Contrast this with today's MVPD market which is characterized by rapidly evolving technology. Video distribution providers serve the public interest in this sense by experimenting with and implementing new technologies that allow them to improve existing services and to offer new services to the public. If consumers are to have access to these improvements and new services, the gap between the consumer electronics and MVPD product life cycles must be bridged. Often, this may simply mean that the operator provides supplemental equipment either to tune additional cable channels or to overcome other technical deficiencies of the subscriber's TV or VCR, such as excessive DPU leakage. Other times, set-top equipment is provided to give subscribers access to new services, such as pay-per-view, sophisticated programming guides, or parental control features, that would otherwise be unavailable without this modular approach.

Indeed, the modular approach towards achieving compatibility and additional functionality between cable and consumer

electronics equipment is consistent with the experience in many areas of the computer and telecommunications industries. In those industries, the existence of multiple standards and multiple vendors has engendered a vibrant market for "translators" and "gateways" -- supplemental devices that permit communications between otherwise incompatible components as a substitute for interface standards.⁴⁹ For example, an office whose computer network consists of IBM personal computers will incur additional costs for gateway products if it desires to increase the functionality of its network by incorporating inherently incompatible Apple Macintosh computers. In this case, the office makes a choice that it is unwilling to forego the additional functionality achieved by the inclusion of Macintosh computers in its network merely to avoid the inconvenience and incremental expense of an intervening translator. Likewise, the television viewer can choose whether the additional entertainment value accrued via a subscription to cable justifies the purchase or rental of new or supplemental equipment to achieve the desired compatibility.

It is also important for the Commission to recognize that all service delivery media other than broadcast (e.g., satellite, telcos, MMDS, etc.) routinely provide an interface box in the

⁴⁹ See Stanley M. Besen and Garth Saloner, "The Economics of Telecommunications Standards," in Changing the Rules: Technological Change, International Competition, and Regulation in Communications 178, 191 (1989).

home.⁵⁰ The focus in recent times on cable boxes is due in large part to the high penetration of cable service. However, the same benefits and incompatibility issues arise for other media as well. In short, GIC urges the Commission to step back and view the compatibility question with a broader perspective, one that acknowledges that incompatibilities are not inherently sinister. In fact, they are often the necessary byproduct of maintaining innovation and increased consumer choice at the intersection of industries that are characterized by an otherwise benign, yet fundamental, technological disjunction in product life cycles.

2. Incompatibilities Also Arise As a Result of Operator Efforts to Prevent Consumers From Stealing Their Signals

Incompatibility also arises in part as a result of operators' efforts to protect their services from theft by consumers. As discussed in section I, supra, piracy in the cable industry and other industries is rampant. Thus, in this instance, incompatibility flows from a fundamental business imperative.

Despite the fact that incompatibility generally flows from business realities that serve the public interest, some have

⁵⁰ Among other things, these boxes are typically needed to accommodate the media-specific modulation technique used in the particular distribution system. See also the discussion at p. 20, supra, regarding the need for media-specific modulation methods. Of course, one way to reconcile the necessity of media-specific modulation techniques with the desire to achieve greater interoperability with TV sets would be to make TVs modular, much like a component stereo system. In that case a consumer could simply connect her TV display unit to her network provider of choice using the appropriate module to demodulate the network provider's signals.

argued that to achieve compatibility, the government must establish rigorous digital transmission standards and require that "in the clear" security techniques replace scrambling.

As described in section III, supra, imposition of digital standards on MVPDs would severely undermine the level of competitiveness and innovation in this technologically dynamic industry. Standards are particularly unwarranted in light of the fact that the Commission's current rules are achieving the 1992 Cable Act's specific compatibility requirements while still allowing for continued innovation and operator discretion in the use of security technologies. For example, Section 76.630(d) requires that cable operators offer special equipment that will allow the simultaneous reception of multiple signals in order to allow subscribers to be able to watch one program while simultaneously taping another. Section 76.630(e) also requires that cable operators undertake and maintain a comprehensive consumer education program on compatibility issues. In the absence of any record evidence that these regulations are insufficient to address existing compatibility concerns, the Commission should not take the extraordinary step of mandating digital transmission standards.

It is equally clear that governmental actions to further restrict scrambling and favor "in the clear" security technologies are at odds with business realities and the Commission's longstanding recognition of the benefits of

scrambling. For example, after a thorough analysis of satellite programming scrambling, the Commission correctly concluded that

[b]oth programmers and cable operators have good business reasons for scrambling, reasons that are in accord with public policy objectives as well. ... [S]crambling has legitimate public interest justifications -- to protect programmers from commercial theft and to allow them to recover compensation from all who view their copyrighted product. The same public interest justifications underlie our copyright laws.⁵¹

A New York State commission, which undertook an extensive analysis of the compatibility of scrambling and other technologies, similarly concluded:

[Scrambling] represents state-of-the-art technology in the cable industry. It also represents an important and necessary measure to combat extensive theft of cable service in Manhattan. Other means of fighting theft, including the interdiction technology being tested in several locations around the country, do not yet compare with signal encoding and converter boxes." (emphasis added).⁵²

Also recognizing the consumer benefits of scrambling, the cable consumer electronics compatibility group ("C3AG") (comprised of the principal members of the cable and consumer electronics industries) has previously agreed on the superiority

⁵¹ Inquiry into the Scrambling of Satellite Television Signals by Owners of Home Satellite Dish Antennas, 2 FCC Rcd. 1669, at ¶ 76, 220 (1987). See also Inquiry into the Scrambling of Satellite Television Signals by Owners of Home Satellite Dish Antennas, 3 FCC Rcd. 1202, at ¶ 11 (1988) ("By maintaining the incentives to produce programming, scrambling serves the public interest").

⁵² "Cable Television: Equipment Compatibility Hearing," attached as Appendix A to Comments of NYC in ET Docket 93-7 (filed March 22, 1993) at 19-20 (emphasis added).

of scrambling technology in formal comments filed with the Commission:

[W]hile [anti-theft measures such as traps, interdiction, broadband descrambling, and other "in-the-clear" approaches] may have their virtues -- and individual cable operators may find them to be appropriate solutions to their particular needs -- none of them is suitable for universal deployment; each has limitations and characteristics that prevent it from reasonably being prescribed as a mandatory solution to compatibility issues. The Advisory Group recognizes that scrambling and encryption are an important part of providing cable services and will remain an essential part of delivering video signals.⁵³

By contrast, the shortcomings of "in the clear" security techniques are amply delineated in the Commission's proceeding on cable equipment compatibility.⁵⁴ GIC will not repeat these problems here.

Finally, GIC notes that with the increasing level of MVPD competition will come increasing experimentation and innovative ways to deliver diverse new services in consumer friendly ways. The Commission should be extremely circumspect about mandating certain compatibility solutions that could curtail such activity.

⁵³ C3AG Supplemental Comments, filed on July 21, 1993 at 7-8 (emphasis added).

⁵⁴ See, e.g., Cablevision Comments at 6-7; CATA Comments at 7, 12; Continental Cablevision Comments at 20; Greater Media, Inc, et al. Comments at 4-6; Intermedia Comments at 2, 11-13; NCTA Comments at 14-19, 39; NYC Appendix A at 20; Scientific Atlanta Comments at 5; Telecable Comments at 11, Appendix C; Time Warner Comments at 17-24, 32-34. (All references are to comments filed in ET Docket No. 93-7, filed in response to the Commission's NOI on March 22, 1993).

IV. SPECIFIC RECOMMENDATIONS

The NOI asks commenters to propose modifications to the Commission's regulatory framework that will eliminate impediments to the competitive deployment of new technologies.⁵⁵ In this section, GIC makes specific recommendations targeted at achieving this objective.

A. Security

1. Avoid Further Federal Restrictions on Operator Discretion to Employ Particular Security Techniques

In light of the rampant piracy in the cable industry (as discussed in section I, supra), and the fact that scrambling is the most effective method to prevent such piracy, GIC strongly urges the Commission to impose no further restrictions on scrambling or any other security technology.⁵⁶

This recommendation is consistent with Administration policy:

The government does not intend to mandate security products for private sector use, but instead to depend on the marketplace to select those products that best meet the needs of the various NII Participants.⁵⁷

⁵⁵ See NOI at ¶ 71(e).

⁵⁶ See Equipment Compatibility Order, 9 FCC Rcd. 1981, ¶ 58 (1994). Cable operators are currently prohibited from scrambling basic tier signals unless a Commission waiver is obtained. 47 C.F.R. § 76.630(a).

⁵⁷ NII Security: The Federal Role, Draft Report of the National Information Infrastructure Security Issues Forum, June 14, 1995, at section IV.A.3. Broad operator flexibility to utilize scrambling and other security technologies is also consistent with the U.S. Court of Appeals for the D.C. Circuit's recent decision affirming that cable operators have liability for the distribution of obscene or indecent programming over leased

It also is consistent with the Commission's own words in its Tier Buy Through Order:

The need to comply with the regulatory policies incorporated in the 1992 Cable Act, including the mandatory signal carriage rules, the rate regulation provisions, and the equipment compatibility requirements, along with the benefits associated with the development of new programming services and potential technological developments, make it highly desirable that systems retain the flexibility to alter their channel configurations and signal access control mechanisms. Thus, we do not intend to mandate the continued use of any particular mode of operation.⁵⁸

Such flexibility with respect to security technologies is critical to the long-term competitiveness of the cable industry and should not be further compromised by restrictive government policies.

2. Preempt Local Attempts to Restrict Operator Discretion to Employ Particular Security Techniques

Of course, restraint by the federal government from imposing further security restrictions on cable operators will be rendered meaningless if each of the 30,000 local communities that are authorized to regulate cable operators are permitted to impose their own parochial restrictions on security and the use of customer equipment. Such excessive local discretion invites the creation of a patchwork of inconsistent and unmanageable

access and public access channels. This potential operator liability and the fact that scrambling is the most effective way to secure obscene and indecent programming from the view of people who do not wish to receive it provides an additional reason why the government should not further restrict operators' use of scrambling or any other security method.

⁵⁸ Tier Buy-Through Order, 8 FCC Rcd. 2274, at ¶ 20 (1993).

regulations, the only effect of which would be to derail the Commission's and Congress's vision of a ubiquitous NII.

Fortunately, the Commission currently has before it petitions which will allow it to rule on these issues and prevent such untoward results. Specifically, the Commission should: (1) deny the petitions filed last year by New Hampshire⁵⁹ and Chapel Hill, NC,⁶⁰ regarding the right of state and local authorities to erect localized equipment and security roadblocks to NII buildout; and (2) broadly preempt further local activity in this area. Because the record in the New Hampshire and Chapel Hill proceedings fully address the specific legal and policy bases for such a preemption,⁶¹ GIC will not duplicate those arguments here.

B. Adopt Streamlined Cost Recovery Mechanisms to Promote Substantial System Upgrades

The Commission is correct that there are certain impediments to digital conversion, the most significant of which is the lack of a clear cost recovery rule for substantial network upgrades. In that regard, GIC is pleased to learn that the Commission is

⁵⁹ See Petition for Declaratory Ruling Filed By New Hampshire House of Representatives Committee on Science, Technology & Energy Concord, NH, filed March 18, 1994, PN 43173.

⁶⁰ See Petition for Declaratory Ruling Filed by the Mayor and Town Council Town of Chapel Hill, NC, CSR-4291-Z, filed July 21, 1994.

⁶¹ See Comments of General Instrument Corporation, filed on June 23, 1994, in the New Hampshire proceeding. See Comments of Time Warner Entertainment Company, L.P., filed on September 1, 1994, in the Chapel Hill proceeding.

currently working on a streamlined cost-of-service form.⁶²

Without the availability of a streamlined alternative to costly and complex traditional cost-of-service filings, upgrades to higher capacity, fiber-based systems that will be required for the cable industry to remain competitive in the next generation of broadband delivery will be significantly delayed.

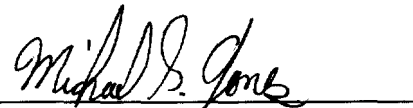
⁶² See "FCC Working on Incentive Upgrade Plan for Cable," Multichannel News, May 8, 1995, at 1. Other rate-based incentives to upgrade should also be considered.

CONCLUSION

For the foregoing reasons, GIC respectfully urges the Commission to seriously consider the level of piracy in the MVPD marketplace and the stifling and commoditizing effects of premature standard setting in its assessment of the competitive structure of the MVPD industry. In addition, as the Commission approaches issues regarding the conversion to digital technology, retail sale of customer equipment, and equipment compatibility, the Commission should keep these two central issues -- the importance of network security and the potentially negative effects of standard setting -- at center stage.

Respectfully submitted,

GENERAL INSTRUMENT CORPORATION



Geoffrey S. Roman
Senior Vice President
Communications Division
Quincy Rodgers
Associate General Counsel
and Director, Government
Affairs
Christine G. Crafton
Director, Industry Affairs
General Instrument Corporation
1133 21st Street, N.W.
Suite 405
Washington, DC 20036-3384

Jeffrey Krauss
Consultant
17 West Jefferson Street
Suite 106
Rockville, MD 20850

Michael H. Hammer
Francis M. Buono
Michael G. Jones

WILLKIE FARR & GALLAGHER
Three Lafayette Centre
1155 21st Street, N.W.
Suite 600
Washington, D.C. 20036-3384
Its Attorneys

June 30, 1995

EXHIBIT



Take Control of Home Video

Radio Shack's complete line of video accessories lets you take control of your home entertainment system

Play your VCR in one room—watch in another! Send video signals through walls without wires or bulky cables

Wireless video distribution system. Here's a simple solution to a common video problem. Have you ever wanted to watch a video from the VCR in your living room on a TV in your bedroom? You probably tried running a cable through doorways, or even walls. Well, now you can watch a video anywhere in your house without running wires. Here's how:

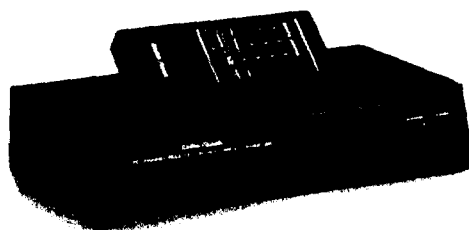
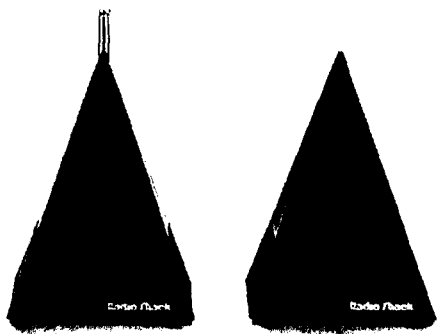
A small transmitter unit connected to your VCR or other source sends a video program to a matching receiver placed on a remote TV located elsewhere in the house. So now you can watch video from a cable box, VCR or laser disc—anywhere you place a remote TV!

Save money by not having to buy another VCR—add a simple A/B switch, and the kids can watch a video on their own TV while you still enjoy the game in the living room. Video buffs will like the ability to remotely monitor camcorders or security cameras. And it won't affect regular TV and cable reception.

Has RCA jacks on the transmitter to add a VCR or other component and a 75-ohm coax jack for connecting to an antenna or cable box. Selectable input lets you pass either signal to the remote unit. **15-1958 99.99**
Extra Receiver. Available on special order (CMC). **15-2301 49.99**

Wireless remote extender lets you control stereo systems, TVs, VCRs and more from any room

Our wireless remote extender boosts the range of any video or audio component's existing remote, letting you control your video or audio equipment from any room in the house—up to 100 feet away! A transmitting unit passes your commands to your VCR, TV or stereo system without connecting wires. Select channels on your cable box or VCR from a remote viewing room. Or control a stereo from another room where you've installed a second set of speakers. **15-1959 49.99**



70-channel cable TV converter

Why rent when you can have your own converter box complete with infrared remote? Features scan and direct-entry tuning, previous channel flashback and sleep timer. Channel 3 or 4 output. Works with most cable systems. Will not descramble. **15-1287 99.99**



Amplified stereo A/V selector

Stop swapping cables! Just push a button to route audio and video signals from any of four sources to a TV and VCR. View one source while recording another. Four sets of RCA line-level inputs for video, left and right audio. Two line-level outputs. **15-1951 39.99**



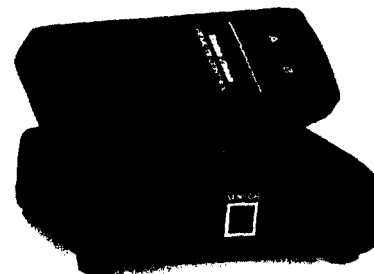
Dubbing processor preserves video sound and picture quality

Your copies will look and sound better than ever when taping between VCRs! Audio and video enhancement controls guard against signal loss when taping. Fine-tune sound and picture for great dubs every time. **15-1955 24.99**



Stereo audio/video selector lets you select between 4 sources

Push a single button to choose between VCR, laser disc, camcorder and any other video component. Output to stereo or TV. Four sets of RCA line-level inputs for video, left/right audio. Line-level output. **15-1956 24.99**



Video A-B switch with infrared remote-controlled switching

Select between two 75-ohm video sources with the supplied remote or any universal learning remote. Switch between any two of laser disc, antenna, satellite, VCR or cable without leaving your chair. **15-1957 39.99**

Equipment on these two pages include manuals with easy-to-follow instructions.

We Make it Simple to Improve Your Video System!

70-Channel Cable Converter With Remote



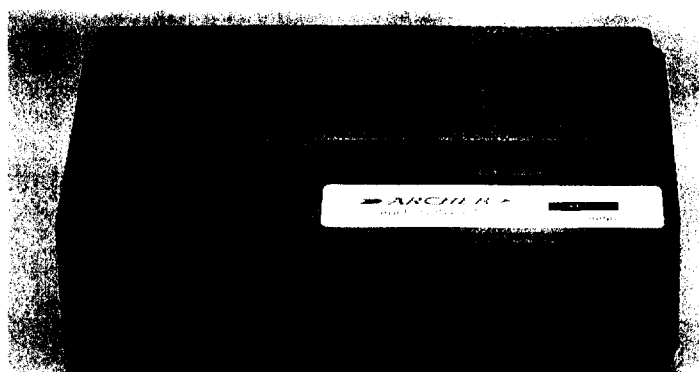
99⁹⁵

Low As \$15
Per Month

- Easy Hookup ■ Sleep Timer ■ Channel Flashback
- 17-Key IR Remote ■ Works With All Cable Systems

Multifunction remote! Scans, tunes directly, fine-tunes and provides flashback to previous channel. Remote also turns TV and converter on/off and sets timer for auto shutoff up to 90 minutes later. Ch. 3 or 4 output. 21 1/2" x 11 1/2" x 6 1/4". With patch cable, splitter. UL listed AC. Remote requires 9V battery. 15-1287 (TSP available) 99.95

Archer® Cable TV Block Converter



29⁹⁵

Converts VHF,
Mid and Superband
Cable-TV Channels
To UHF Channels

- Watch One Channel and Tape Another With Your VCR
- Restore Remote-Control Functions to Your TV and VCR

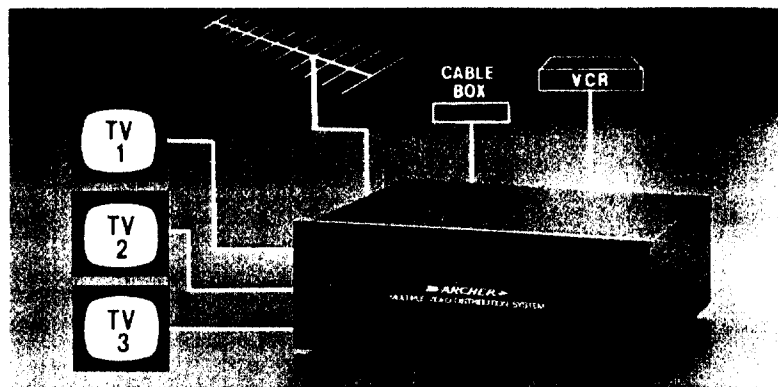
Compact, simple to install and use. Converts cable channels to UHF-TV band for selection with TV/VCR channel selector or remote. If you have a remote-control VCR or TV set, adding this converter restores remote-control tuning. Manual fine-tuning. 75-ohm connectors. 2 x 6 x 3 1/2". UL listed AC. 15-1281 29.95

Video Distribution System Delivers All Your Video Sources to Every TV

- Watch VCR, Cable or Satellite TV
On TV Sets Throughout Your Home
- Choose Video Source With Each TV
Channel Selector or Remote Control

49⁹⁵

Watch what you want—where you want! Sends programs from your cable box, antenna and VCR to every TV. Independent channel selection at each set. Three amplified outputs. Easy hookup with coax cable or use existing coax in prewired homes. 21 1/2" x 7 x 6 7/8". UL listed AC. 15-1290 49.95



Infrared Remote Control Extender

- Operate Remote-Control Video
And Audio Equipment From
Another Room in Your Home
- Works With Any Infrared Remote

49⁹⁵

Sends commands from any infrared remote control back to the original source through existing coax cable. Here's how you can use it: Your remote-control cable box, VCR or satellite receiver is in the living room and connected to a second TV in the bedroom. With the Extender, you don't have to leave the bedroom to change channels or control VCR. UL listed AC. 15-1289 49.95



EQUIPMENT ON THIS PAGE INCLUDES MANUALS WITH EASY-TO-FOLLOW HOOKUP DIRECTIONS